Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_TP:\_\_\_\_\_\_\_\_

CW#7H: Real World Linear Equations - MONDAY

Honors Geometry Pd. 3

1. Find an equation for the line that passes through the point (−3, 6), parallel to the line through the points (0, −7) and (4, −15). Write your answer in point-slope form.

2. Sid has a job at Morgan Motors. The salary is $1200 a month, plus 3% of the sales price of every car or truck Sid sells (this is called a commission).

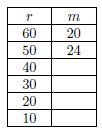
(a) The total of the sales prices of all the vehicles Sid sold during the first month on the job was $72 000. What was Sid’s income (salary plus commission)?

(b) In order to make $6000 in a single month, how much selling must Sid do?

(c) Write a linear equation that expresses Sid’s monthly income y in terms of the value x of the vehicles Sid sold.

(d) Graph this equation. What are the meanings of its y-intercept and slope?

3. What is unusual about the graphs of the equations 9x−12y = 27 and −3x+ 4y = −9?

4. The fuel efficiency m (in miles per gallon) of a truck depends on the speed r (in miles per hour) at which it is driven. The relationship between m and r usually takes the form m = a|r − h| + k. For Sasha’s truck, the optimal fuel efficiency is 24 miles per gallon, attained when the truck is driven at 50 miles per hour. When Sasha drives at 60 miles per hour, however, the fuel efficiency drops to only 20 miles per gallon.

(a) Find another driving speed r for which the fuel efficiency

of Sasha’s truck is exactly 20 mpg.

(b) Fill in the rest of the missing entries in the table.

(c) Draw graph of m versus r, for 0 < r ≤ 80.

(d) Find the values of k, a, and h. 10

5. The line through (1, 6) and (0, 3) passes through every quadrant except one. Which one?

6. Graph the system of equations shown at right. What special relationship exists 3*x − y* = 10

between the two lines? Confirm this by solving the equations algebraically. 6*x* = 20+2*y*

7. Each step of the stairs leading from room 9 to room 107 in the Academy Building has a vertical rise of 7 inches and a horizontal run of 12 inches. Each step of the marble staircase leading to the Assembly Hall has a vertical rise of 5.5 inches and a horizontal run of 13 inches.

(a) Which flight of stairs do you think is steeper? Why?

(b) Calculate the ratio rise/run for each flight of stairs, and verify that the greater ratio belongs to the flight you thought to be steeper.

8. (Continuation) The slope of a line is a measure of how steep the line is. It is calculated by dividing the change in y-coordinates by the corresponding change in x-coordinates between two points on the line: slope = change in y change in x. Calculate the slope of the line that goes through the two points (1, 3) and (7, 6). Calculate the slope of the line that goes through the two points (0, 0) and (9, 6). Which line is steeper?

9. Explain why the descriptions “right 5 up 2”, “right 10 up 4”, “left 5 down 2”, “right 5/2 up 1”, and “left 1 down 2/5” all describe the same inclination for a straight line.

10. At noon one day, the Exeter River peaked at 11 feet above flood stage. It then began to recede, its depth dropping at 4 inches per hour.

(a) At 3:30 that afternoon, how many inches above flood stage was the river?

(b) Let t stand for the number of hours since noon, and h stand for the corresponding number of inches that the river was above flood stage. Make a table of values, and write an equation that expresses h in terms of t.

(c) Plot h versus t, putting t on the horizontal axis.

(d) For how many hours past noon was the river at least 36 inches above flood stage?

11. Write and graph an equation that states:

(a) that the perimeter of an *l × w* rectangle is 768 cm;

(b) that the width of an *l × w* rectangle is half its length.

12. (Continuation) Explain how the two graphs show that there is a unique rectangle whose perimeter is 768 cm, and whose length is twice its width. Find the dimensions of this rectangle.

13. What is the *y*-intercept of the line *ax* + *by* = *c*? What is the *x*-intercept?